REMARKS

In the Office Action mailed January 10, 2007, the Examiner took the following action: (1) rejected claims 1, 3-4, 14, 16-17, 27, and 29-30 under 35 U.S.C. §102(b) as being anticipated by Lin (US 2002/0116126); (2) rejected claims 2, 11, 15, 24, 28, and 37 under 35 U.S.C. §103(a) as being unpatentable over Lin in view of Hedrick (US 6462703); (3) rejected claims 5-7, 18-20, and 31-33 under 35 U.S.C. §103(a) as being unpatentable over Lin in view of Halpert (US 2841345); (4) rejected claims 8-10, 21-23, and 34-36 under 35 U.S.C. §103(a) as being unpatentable over Lin in view of Finvold (US 3012180); (5) rejected claims 12-13, 25-26, and 38-39 under 35 U.S.C. §103(a) as being unpatentable over Lin in view of Leslie (US 4750127). Applicant respectfully requests reconsideration of the application in view of the foregoing amendments and the following remarks.

I. Rejections under 35 U.S.C. §102(b) and §103(a)

<u>Claim 1-8 and 10-13</u>

As amended, claim 1 recites:

> 1. A method comprising:
> receiving previously recorded altitude information generated by an inertial navigation system (INS) of an aircraft and altitude information generated by a global positioning system (GPS) of the aircraft; and
> determining altitude information of the aircraft based on the received altitude information generated by the INS of the aircraft and altitude information generated by the GPS of the aircraft, *wherein determining includes performing a curve fit between the INS altitude information and the GPS altitude*. (emphasis added).

Lin (US 2002/0116126)

Lin teaches a positioning system that incorporates information from an inertial measurement unit 20 and a global positioning system 40, and combines signals from the IMU 20 and GPS 40 to provide an altitude error. (Paragraph [0133]). According to Lin, a least squares curve fit may be used to resolve heading measurement errors (Paragraph [0285]), and may also be used to resolve error components associated with a carrier phase measurement that may adversely impact position measurements using the GPS 40. (Paragraph [0170]-[0173]). More specifically, Lin teaches that a "least square adjustment module 822" may be used to adjust a range error induced by an ephemeris error (Paragraph [0173], [0178]), a troposphere delay error (Paragraph [0179]), an ionospheric delay error (Paragraph [0180]), and a satellite clock error (Paragraph [0181]). The least square adjustment module 822 of Lin is used "to fix the carrier phase ambiguity." (Paragraph [0182]).

Applicant respectfully submits that Lin fails to disclose, teach, or fairly suggest the method recited in claim 1. Specifically, Lin fails to teach or suggest a method that includes determining altitude information of the aircraft based on the received altitude information generated by the INS of the aircraft and altitude information generated by the GPS of the aircraft, *wherein determining includes performing a curve fit between the INS altitude information and the GPS altitude* as recited in claim 1.

In the rejection of original claim 6, the Examiner asserts that Lin teaches that *determining includes performing a curve fit between the INS altitude information and the GPS altitude.* Applicant respectfully disagrees. Lin teaches using a "least square adjustment module 822" to resolve error components associated with a carrier phase measurement that may adversely impact position measurements using the GPS 40 (Paragraph [0173-0181]), and "to fix the carrier phase ambiguity." (Paragraph [0182]). There is, however, no teaching or suggestion in Lin to determine altitude information of the aircraft based on the received altitude information generated by the INS of the aircraft and altitude information generated by the GPS of the aircraft,

wherein determining includes performing a curve fit between the INS altitude information and the GPS altitude as recited in claim 1. For this reason, claim 1 is allowable over Lin.

Claims 2-8 and 10-13 depend from claim 1 and are allowable over Lin at least due to their dependencies on claim 1, and also due to additional limitations recited in those claims. For example, claim 6 recites the method of claim 1 wherein performing a curve fit between the INS altitude information and the GPS altitude information includes: *if four or more differential GPS points are available, using a second order least squares fit equation.* (emphasis added). Similarly, claim 7 recites the method of claim 6, wherein performing the curve fit includes: *if three differential GPS points are available, using a first order fit equation, and if less than three differential GPS points are available, using a zero order fit equation.* (emphasis added). These additional limitations are also not disclosed, taught, or fairly suggested by Lin.

Hedrick (US 6462703)

Hedrick fails to remedy the above-noted deficiencies of Lin. Specifically, Hedrick teaches methods of high precision altitude measurement for an aircraft. According to Hedrick, a radar system on the aircraft is used to determine an above ground level (AGL) altitude measurement, and a mean sea level (MSL) altitude of the local ground level is determined based on the position of the aircraft (determined by a GPS) and a model of the known local topography. (3:18-4:42). The MSL altitude of the aircraft is then determined by adding these values and making appropriate error adjustments. (4:43-53).

Halpert (US 2841345)

Halpert fails to remedy the above-noted deficiencies of Lin and Hedrick. Specifically, Halpert teaches systems for smooth radio controlled landings of aircraft. According to Halpert, a barometric altimeter or a radio altimeter is used to determine a rate of change of altitude during an aircraft descent, and this information is used to provide an asymptotic approach (or "flare

out") to the ground during a landing. (2:3-25). Halpert is silent with respect to the desirability or the possibility of using an IMU or a GPS to determine altitude.

Finvold (US 3012180)

Finvold fails to remedy the above-noted deficiencies of Lin, Hedrick, and Halpert. Specifically, Finvold teaches inertial altitude control systems for aircraft control. According to Finvold, vertical accelerations introduced into an aircraft by a pilot manipulating the controls may be detected using a doubly-integrated signal output from an accelerometer (1:19-24), and the control signals may be damped as taught by Finvold to reduce accelerations that would otherwise be experienced by the aircraft, crew, passengers, and payload. (2:30-48). Although Finvold teaches making inertial measurements using an accelerometer, Finvold is silent with respect to the desirability or the possibility of using a GPS to determine altitude.

Leslie (US 4750127)

Similarly, Leslie fails to remedy the above-noted deficiencies of Lin, Hedrick, Halpert, and Finvold. Leslie teaches aircraft flight management systems that includes an energy compensation means. According to Leslie, the energy compensation means adjusts a target speed of the aircraft downward when a current altitude of the aircraft exceeds a target altitude associated with the aircraft's position. (5:7-6:61; Abstract). Leslie is silent with respect to the desirability or the possibility of using an IMU or a GPS to determine altitude.

Applicant respectfully submits that the Cited References (Lin, Hedrick, Halpert, Finvold, and Leslie) fail to disclose, teach, or fairly suggest the method recited in claim 1. More specifically, the Cited References fail to teach or suggest a method that includes determining altitude information of the aircraft based on the received altitude information generated by the INS of the aircraft and altitude information generated by the GPS of the aircraft, *wherein*

determining includes performing a curve fit between the INS altitude information and the GPS altitude as recited in claim 1. Claim 1 is therefore allowable over the combined teachings of the Cited References.

Claims 2-8 and 10-13 depend from claim 1 and are allowable over the Cited References at least due to their dependencies on claim 1, and also due to additional limitations recited in those claims. For example, claim 6 recites the method of claim 1 wherein performing a curve fit between the INS altitude information and the GPS altitude information includes: *if four or more differential GPS points are available, using a second order least squares fit equation.* (emphasis added). Similarly, claim 7 recites the method of claim 6, wherein performing the curve fit includes: *if three differential GPS points are available, using a first order fit equation, and if less than three differential GPS points are available, using a zero order fit equation.* (emphasis added). These additional limitations are also not disclosed, taught, or fairly suggested by the Cited References.

Claim 14-26

As amended, claim 14 recites:

> 14. One or more computer readable media containing computer readable instructions that, when executed, perform a method comprising:
>
> receiving previously recorded altitude information generated by an inertial navigation system (INS) of an aircraft and altitude information generated by a global positioning system (GPS) of the aircraft; and
>
> determining altitude information of the aircraft based on the received altitude information generated by the INS of the aircraft and altitude information generated by the GPS of the aircraft, *wherein determining includes performing a curve fit between the INS altitude information and the GPS altitude information.* (emphasis added).

For the reasons set forth above, Applicant respectfully submits that the Cited References (Lin, Hedrick, Halpert, Finvold, and Leslie) fail to disclose, teach, or fairly suggest the computer

readable media recited in claim 14. More specifically, the Cited References fail to teach or suggest a computer readable media containing instructions that perform a method that includes determining altitude information of the aircraft based on the received altitude information generated by the INS of the aircraft and altitude information generated by the GPS of the aircraft, *wherein determining includes performing a curve fit between the INS altitude information and the GPS altitude* as recited in claim 14. Claim 14 is therefore allowable over the combined teachings of the Cited References.

Claims 15-21 and 23-26 depend from claim 14 and are allowable over the Cited References at least due to their dependencies on claim 14, and also due to additional limitations recited in those claims. For example, claim 19 recites the computer readable media of claim 14 wherein performing a curve fit between the INS altitude information and the GPS altitude information includes: *if four or more differential GPS points are available, using a second order least squares fit equation.* (emphasis added). Similarly, claim 20 recites the computer readable media of claim 19, wherein performing the curve fit includes: *if three differential GPS points are available, using a first order fit equation, and if less than three differential GPS points are available, using a zero order fit equation.* (emphasis added). These additional limitations are also not disclosed, taught, or fairly suggested by the Cited References.

Claim 27-34 and 36-39

As amended, claim 27 recites:

> 27. An apparatus comprising:
> memory for storing recorded altitude information generated by an inertial navigation system (INS) of the aircraft and altitude information generated by a global positioning system (GPS) of the aircraft;
> one or more user interface devices; and
> a processor coupled to the memory and the one or more user interface devices, the processor including:
> a first component configured to determine altitude information of the aircraft based on the received altitude information generated by the

> INS of the aircraft and altitude information generated by the GPS of the aircraft, *wherein determining includes performing a curve fit between the INS altitude information and the GPS altitude information.* (emphasis added).

As described more fully above, Applicant respectfully submits that the Cited References (Lin, Hedrick, Halpert, Finvold, and Leslie) fail to disclose, teach, or fairly suggest the apparatus recited in claim 27. More specifically, the Cited References fail to teach or suggest an apparatus that includes a first component configured to determine altitude information of the aircraft based on the received altitude information generated by the INS of the aircraft and altitude information generated by the GPS of the aircraft, *wherein determining includes performing a curve fit between the INS altitude information and the GPS altitude* as recited in claim 27. Claim 27 is therefore allowable over the combined teachings of the Cited References.

Claims 28-34 and 36-39 depend from claim 27 and are allowable over the Cited References at least due to their dependencies on claim 27, and also due to additional limitations recited in those claims. For example, claim 32 recites the apparatus of claim 27 wherein performing a curve fit between the INS altitude information and the GPS altitude information includes: *if four or more differential GPS points are available, using a second order least squares fit equation.* (emphasis added). Similarly, claim 33 recites the apparatus of claim 32, wherein performing the curve fit includes: *if three differential GPS points are available, using a first order fit equation, and if less than three differential GPS points are available, using a zero order fit equation.* (emphasis added). These additional limitations are also not disclosed, taught, or fairly suggested by the Cited References.

CONCLUSION

For the reasons set forth above, Applicant respectfully submits that pending claims 1-8, 10-21, 23-34, and 36-39 are now in condition for allowance. If there are any remaining matters that may be handled by telephone conference, the Examiner is kindly invited to telephone the undersigned at the telephone number listed below.

Respectfully Submitted,

Dated: __March 10, 2007____

By: __/Dale C. Barr, Reg. No. 40498/__________

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